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INFLUENCE OF SEASON OF FRESHENING ON PRODUCTION AND INCOME FROM DAIRY COWS.

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BASIS OF THE DATA.

There is a widespread belief that cows produce more milk and butterfat, and that they produce more economically, if they freshen in the fall or winter than if they freshen in the spring or summer. Tabulations of cow-testing-association records show that a definite relation does exist between season of freshening and other factors, but that the relation is not the same everywhere and under all conditions. That relation seems to depend to some extent on cost of feed, condition of pastures, and geographical location with reference to markets.

Under such circumstances a study of averages for a large number of cow-testing associations taken indiscriminately might be misleading unless followed by a further study of the records of each association. The conclusions given in the following pages are based on averages of the records of 64 associations combined, and on averages of the records of each association. The figures cover the period 1910 to 1920, inclusive. From each association the records used were for one year only. To avoid possible error due to incomplete data or to short-time tests, records were discarded if the breed and age were omitted or if the cow was on test less than 12 months. Tabulations on breed and age showed that these were not factors influencing the conclusions drawn in this bulletin. In the 64 associations studied there were on yearly test 10,870 cows whose age and date of freshen-

ing were given. The computations in this bulletin are based on the records of these cows. Cost of feed and price of product are based on actual figures as given by the testers on the individual cow record sheets.

INFLUENCE OF SEASON OF FRESHENING.

In Table 1 the records of the cows on test 12 months in 64 cow-testing associations are grouped according to the season when the cows freshened.

TABLE 1.—*Date of freshening, by seasons, with average yearly feed and production records, per cow.*

Season.	Number of cows.	Milk production.	Butterfat production.	Cost of roughage.	Cost of grain.	Cost of feed.	Income over cost of feed.
		Pounds.	*Pounds.*				
Spring (March, April, and May).	3,196	5,842	236	$37.51	$19.22	$56.73	$70.73
Summer (June, July, and August)	1,328	5,941	236	37.62	22.48	60.10	66.59
Fall (September, October, and November)	2,862	6,689	268	38.94	28.45	67.39	76.65
Winter (December, January, and February)	3,484	6,439	258	37.65	25.51	63.16	75.66
Total and averages	10,870	6,269	252	37.95	24.06	62.01	73.36

The cows that freshened in the fall months ranked highest in average yearly production of milk and butterfat, in cost of feed and in income over cost of feed. In all these points, the cows that freshened in the winter ranked second. Of the 10,870 cows, 6,346 freshened in the fall and winter and 4,524 freshened in the spring and summer. On an average the cows that freshened in the spring produced the least milk and those that freshened in the summer produced the least income over cost of feed. Care and quality of cows are big factors in determining production and income, but the large number of records in each group would tend to prevent great variation among group averages due to such causes.

Fewer cows freshened in the summer than at any other season. This may have been due partly to a belief among dairymen that it pays better to have cows freshen at some other time of year, a belief that seems to be supported generally by the records. It is also true that the season of freshening can not always be controlled. The feed bill, especially the amount spent on grain, was lowest for the cows that freshened in the spring. This was doubtless because the long pasture period, when little grain was fed, came during the early part of the lactation period. The total cost of feed, however, was not low enough to give the cows that freshened in the spring first or even second place in yearly income over cost of feed. If cost of labor were to be included, the figures would doubtless be even more favorable to fall and early winter freshening, on account of the scarcity and high cost of labor in some districts during the summer months.

VALUE OF PRODUCTS.

Table 2, which is derived from a tabulation of the records of the 64 associations, shows how many times the cows that freshened each season ranked first, second, third, and fourth in average yearly price received for milk or butterfat produced by the cows that freshened within that season.

TABLE 2.—*Seasons when cows freshened ranked according to average price of butterfat or milk.*

Season of freshening.	Number of times ranked.			
	First.	Second.	Third.	Fourth.
Spring	12	11	14	27
Summer	36	14	9	3
Fall	39	18	5	2
Winter	12	20	26	6

The figures do not refer to the price received for the product at any season of the year, but to the average price received during the entire year for the product produced by cows that freshened at a certain season.

There were two associations in which no cows freshened in summer. This accounts for the summer ranks adding up to only 62.

As there were ties for first place in some associations, the total number of times the four seasons received first place is greater than the number of associations compared. The table shows that in average price received for butterfat produced during the year, fall freshening ranked first 39 times; summer, 36; winter, 12; and spring, 12. The cows that freshened in the fall may not have freshened at the time of year when prices were highest, but they produced most of their milk at the time of year when prices were highest.

MILK AND BUTTERFAT PRODUCTION.

In milk production the ranks of the four seasons were as shown in Table 3:

TABLE 3.—*Seasons when cows freshened ranked according to average yield of milk.*

Season of freshening.	Number of times ranked.			
	First.	Second.	Third.	Fourth.
Spring	7	13	24	20
Summer	10	4	19	29
Fall	29	23	7	5
Winter	18	24	14	8

In average yearly milk production, fall ranked first in 29 associations and second in 23 associations. Winter ranked first in 18 associations and second in 24. Summer ranked first in 10 associations and

spring ranked first in only 7. It is also worthy of note that in milk production spring and summer ranked third and fourth in most of the cases.

Table 4 shows the number of times each season ranked first, second, third, and fourth in butterfat production:

TABLE 4.—*Seasons when cows freshened ranked according to average production of butterfat.*

Season of freshening.	Number of times ranked.			
	First.	Second.	Third.	Fourth.
Spring	7	8	27	22
Summer	8	6	17	31
Fall	38	16	7	3
Winter	13	35	11	5

Out of a possible 64, fall ranked first 38 times in average yearly production of butterfat per cow and second 16 times. Winter ranked first 13 times and second 35 times out of a possible 64. Summer ranked first 8 times and fourth 31 times out of a possible 62, there being two associations in which no cows freshened during the summer months. Spring ranked first only 7 times in butterfat production and second 8 times. In average pounds of butterfat produced per cow for all associations combined (see Table 1) fall ranked first, winter second, and spring and summer tied for third and fourth places.

Figure 1 shows graphically the variation of butterfat production according to season of freshening for the 10,870 cows in the 64 associations.

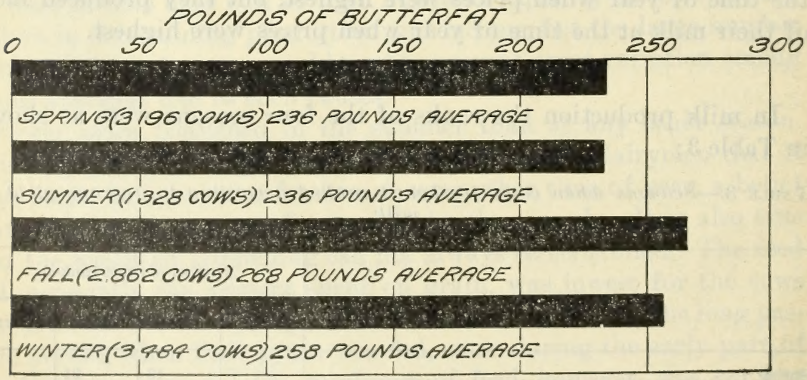

FIG. 1.—Relation of butterfat production to season of freshening.

The cows that freshen in the fall not only rank first in yearly butterfat production, but they produce most during the winter months. In many parts of the country the dairyman has more time in winter to do the extra work connected with their feed and care.

It is also true that fall-freshening cows are dry at the time of year when field work is generally greatest.

FEED COST.

The cost of roughage was about the same regardless of the season of freshening, but there was a considerable difference in the cost of grain. Table 5 shows how the four seasons ranked on average cost of grain per cow; that is, the year's cost of grain for cows of the different seasons.

TABLE 5.—*Seasons when cows freshened ranked according to cost of grain required for the year's feed.*

Season of freshening.	Number of times ranked.			
	First.	Second.	Third.	Fourth.
Spring	6	5	12	41
Summer	9	15	23	15
Fall	44	14	5	1
Winter	5	30	24	5

In 44 of the 64 associations fall freshening ranked first in cost of grain to feed a cow a year and in only one of the 64 associations did the fall-freshening cows rank fourth in cost of grain. On an average the cost of grain was highest for the cows that freshened in the fall (see Table 1), next highest for those that freshened in the winter, and lowest for those that freshened in the spring. The average cost of grain per cow was lowest in 41 of the 64 associations for the cows that freshened in the spring.

As the cost of roughage for the year was about the same regardless of the date of freshening, the total cost of feed varied approximately according to the cost of grain. Table 6 shows how the seasons ranked on total cost of feed.

TABLE 6.—*Seasons when cows freshened ranked according to total cost of feed.*

Season of freshening.	Number of times ranked.			
	First.	Second.	Third.	Fourth.
Spring	8	5	11	40
Summer	9	14	24	15
Fall	42	18	3	1
Winter	5	27	26	6

In 8 associations the feed cost was greatest for the cows that freshened in the spring, in 9 the feed cost was greatest for those that freshened in the summer, in 42 the feed cost was greatest for those

that freshened in the fall, and in 5 the feed cost was greatest for those that freshened in the winter. Referring to Table 1 we find that in all the associations combined and over a period of years the average cost of feed for the cows that freshened in the fall was $67.39; for those that freshened in the winter, $63.16; for those that freshened in the summer, $60.10; and for those that freshened in the spring, $56.73. In practical application the figures should be considered as relative, not absolute. These variations are not great when averages are considered, but they are much greater for some associations and very much greater for single herds in some associations. Where pastures are good and cheap the summer feed cost is low, and where pastures are poor and hard to get the summer feed cost is relatively high.

INFLUENCE OF PASTURE ON FEED COST.

To determine the influence of good pastures on production and income, a comparative study was made of one year's records of two cow-testing associations in the same State and not far apart. For convenience we will call these associations A and B. Association A had good pastures and association B had relatively poor pastures.

In association A the feed cost was greatest for the cows that freshened in the fall, their yearly milk production averaged 446 pounds less and their yearly butterfat production averaged 12 pounds less than those that freshened at other seasons of the year. In income over cost of feed they fell $17.88 behind the average of those that freshened in the summer and $25.97 behind those that freshened in the spring. In income over cost of feed the figures were as follows: Spring freshening, $94.83; winter freshening, $91.67; summer freshening, $86.74; and fall freshening, $68.86. The figures for that association were decidedly against fall freshening, but these results were the exception and not the rule when all the 64 associations were considered.

In association B, where the pastures were poor, feed cost was also greatest for the cows that freshened in the fall, but these cows, as well as those that freshened in the winter, were ahead in production of milk and butterfat and in income over cost of feed. In income over cost of feed the figures for association B (having the poor pastures) were as follows: Fall freshening, $86.18; winter freshening, $85.99; spring freshening, $82.02; and summer freshening, $81.73.

For association A the average income over cost of feed was $85.59 and for association B it was $81.26. The figures do not prove that dairying is more profitable where pastures are good, but they furnish some evidence that the question of pasture should have weight in determining the time of year when it will pay best to have cows freshen. Labor, too, must be considered.

On account of labor and miscellaneous expenses the income over cost of feed is not all net profit in the dairy business, but it is from the income over cost of feed that net profit is obtained. So far as possible, the dairyman should aim to have his cows freshen at the time of year that will bring him the greatest net return. That may or may not be the date of freshening that gives the greatest income over cost of feed. Income over cost of feed is only one of the factors that give net profit, but it is one of the most important. Labor is also a very important factor, but cow-testing records do not furnish data regarding labor costs.

INCOME ABOVE FEED COST.

According to Table 1 fall freshening ranks first in income over cost of feed; winter, second; spring, third; and summer, fourth. There was not much difference, however, between fall and winter freshening in this important respect. For the four seasons the average income over cost of feed for the 64 associations was as follows: Fall freshening, $76.65; winter freshening, $75.66; spring freshening, $70.73; and summer freshening, $66.59.

In Table 7 the seasons are ranked with reference to the relation of date of freshening to income over cost of feed per cow.

TABLE 7.—*Seasons ranked according to relation of date of freshening to income over cost of feed.*

Season of freshening.	Number of times ranked.			
	First.	Second.	Third.	Fourth.
Spring	9	8	21	26
Summer	8	10	17	27
Fall	30	24	7	3
Winter	17	23	18	6

The table shows the number of times each of the four seasons ranked first, second, third, and fourth on income over cost of feed. Fall ranked first 30 times and fourth only 3 times. Winter ranked first 17 times and fourth only 6 times. Spring ranked first 9 times and fourth 26 times, while summer ranked first 8 times and fourth 27 times.

INFLUENCE OF MONTH OF FRESHENING.

Table 8 shows the relation between month of freshening and milk production, butterfat production, gross income, and income over cost of feed of the same cows previously discussed under seasonal influences.

TABLE 8.—*Month of freshening in relation to average annual production and income per cow.*

Month of freshening.	Number of cows.	Milk production.	Butterfat production.	Gross income.	Income over cost of feed.
		Pounds.	*Pounds.*		
January	1,209	6,416	256	$137.64	$74.98
February	1,185	6,164	250	131.24	71.43
March	1,472	5,962	241	129.80	72.51
April	1,047	5,698	231	126.55	70.21
May	677	5,806	232	123.77	67.65
June	460	5,717	224	123.81	65.61
July	396	5,864	233	123.06	63.93
August	472	6,225	250	132.54	69.77
September	779	6,408	259	137.97	72.91
October	1,016	6,865	274	148.33	79.04
November	1,067	6,727	271	144.38	77.10
December	1,090	6,764	268	148.38	81.01
Total and averages	10,870	6,269	252	135.37	73.36

The cows that freshened in September, October, November, December, and January averaged high in production of both milk and

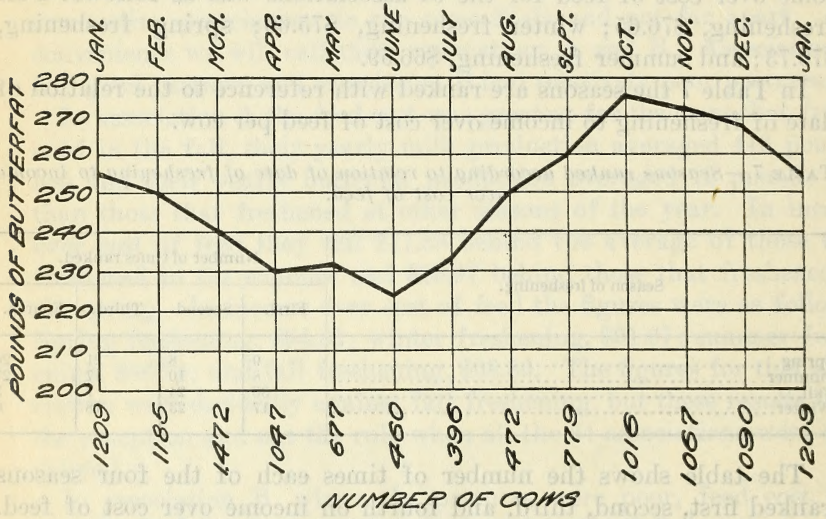

FIG. 2.—Relation of butterfat production to month of freshening.

butterfat. For each of these five groups the average butterfat production was above 250 pounds, but for cows that freshened during other months the average butterfat production never went above 250 pounds. The cows that freshened in April, May, June, and July were lowest in average production of butterfat and those that freshened in July had the lowest average income over cost of feed.

Figure 2 shows graphically the average production of butterfat per cow according to month when cows freshened.

Considering butterfat production alone, October freshening ranks highest for the 64 associations, although November, December, September, and January are not far behind. The regularity with which

yearly butterfat production went down as the date of freshening approached midsummer is only a little less marked than the regularity and rapidity with which yearly butterfat production went up as the date of freshening advanced from June to October. It must be remembered that these figures are the averages for 64 associations and that they do not hold true for every one of the associations.

HOW THE MONTHS RANKED.

Table 9, which was made from the averages of the 64 associations, shows that the cows that freshened in the fall and winter months ranked high in production of milk and butterfat and in income over cost of feed.

TABLE 9.—*Months when cows freshened ranked from 1 to 12 on yearly records of production, costs, and income.*

Month.	Milk production.	Butterfat production.	Value of product.	Cost of roughage.	Cost of grain.	Total feed cost.	Income over cost of feed.
January	4	5	5	7	5	6	4
February	7	6	7	12	7	7	7
March	8	8	8	8	10	10	6
April	12	11	9	6	12	11	8
May	10	10	11	11	11	12	10
June	11	12	10	8	9	9	11
July	9	9	12	10	8	8	12
August	6	6	6	5	6	5	9
September	5	4	4	4	4	4	5
October	1	1	2	1	1	1	2
November	3	2	3	3	2	3	3
December	2	3	1	2	3	2	1

On every topic in this table the three months October, November, and December won the first three ranks, though not always in the same order. This indicates that, on an average, it generally pays to have cows freshen in the fall and early winter. Though they eat more grain, the greater production generally gives them an advantage all along the line.

CONCLUSIONS.

The study that has been made of the records from 64 cow-testing associations shows that fall or early winter freshening is desirable in most parts of the country. The influence of season of freshening is important, but the dairyman who has a steady market for milk at fair prices during all seasons of the year will usually find it to his advantage to keep the supply of dairy products fairly uniform from month to month.

Often the results due to date of freshening are different in different associations, even in the same agricultural district. For that reason no set rule can be given as to what percentage of the cows should freshen each month in the year. That will vary to some

extent in different localities and on different farms in the same locality. At the present time in market-milk districts there is generally a surplus of milk in the late spring and early summer. For that reason, if for no other, the dairy business should be so managed as to have more cows freshen in the fall. Such a practice would add to the profits of the producer, give the consumer a more constant supply of dairy products, and bring about a better distribution of farm labor throughout the year.

SUMMARY.

1. The tabulation includes the yearly records of 10,870 cows in 64 cow-testing associations.

2. On an average the cows that freshened in the fall produced 6,689 pounds of milk, while those that freshened in the winter, summer, and spring produced 6,439, 5,941, and 5,842 pounds, respectively.

3. On an average the cows that freshened in the fall produced 268 pounds of butterfat, while those that freshened in the winter, spring, and summer produced 258, 236, and 236 pounds, respectively.

4. On an average the cows that freshened in the fall returned $76.65 in income over cost of feed, while those that freshened in the winter, spring, and summer returned $75.66, $70.73, and $66.59, respectively.

5. In the 64 cow-testing associations fall freshening ranked first 29 times in average milk production, winter freshening ranked first 18 times, summer freshening 10 times, and spring freshening 7 times.

6. In butterfat production fall freshening ranked first 38 times, winter 13 times, summer 8 times, and spring 7 times.

7. In income over cost of feed fall freshening ranked first 30 times, winter 17 times, spring 9 times, and summer 8 times.

8. In considering the months separately the cows that freshened in October ranked first in production of milk, those that freshened in December ranked second, and those that freshened in November ranked third.

9. In butterfat production October freshening ranked first, November second, December third, and September fourth.

10. In income over cost of feed December freshening ranked first, October second, November third, and January fourth.